

SECTION 4

CONFIGURATION CONTROL

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4.1 Configuration Control Activity

Configuration control is perhaps the most visible element of configuration management. It is the process used by contractors and Government program offices to manage preparation, justification, evaluation, coordination, disposition, and implementation of proposed engineering changes and deviations to effected Configuration Items (CIs) and baselined configuration documentation.

The primary objective of configuration control is to establish and maintain a systematic change management process that regulates life-cycle costs, and:

- Allows optimum design and development latitude with the appropriate degree, and depth of configuration change control procedures during the life-cycle of a system/CI.
- Provides efficient processing and implementation of configuration changes that maintain or enhance operational readiness, supportability, interchangeability and interoperability
- Ensures complete, accurate and timely changes to configuration documentation maintained under appropriate configuration control authority
- Eliminates unnecessary change proliferation

The span of Configuration control begins for the Government once the first configuration document is approved and baselined. This normally occurs when the functional configuration baseline (referred to as the requirements baseline in EIA/IS-649) is established for a system or configuration item. At that point, complementary Government and contractor change management procedures are employed to systematically evaluate each proposed engineering change or requested deviation to baselined documentation, to assess the total change impact (including costs) through coordination with affected functional activities, to disposition the change or deviation and provide timely approval or disapproval, and to assure timely implementation of approved changes by both parties. Configuration control is an essential discipline throughout the program life cycle.

Figure 4-1 illustrates a top-level activity model of the configuration control process. It shows the configuration control process divided into three segments which are detailed in **Figures 4-2, 4-3 and 4-4**, respectively.

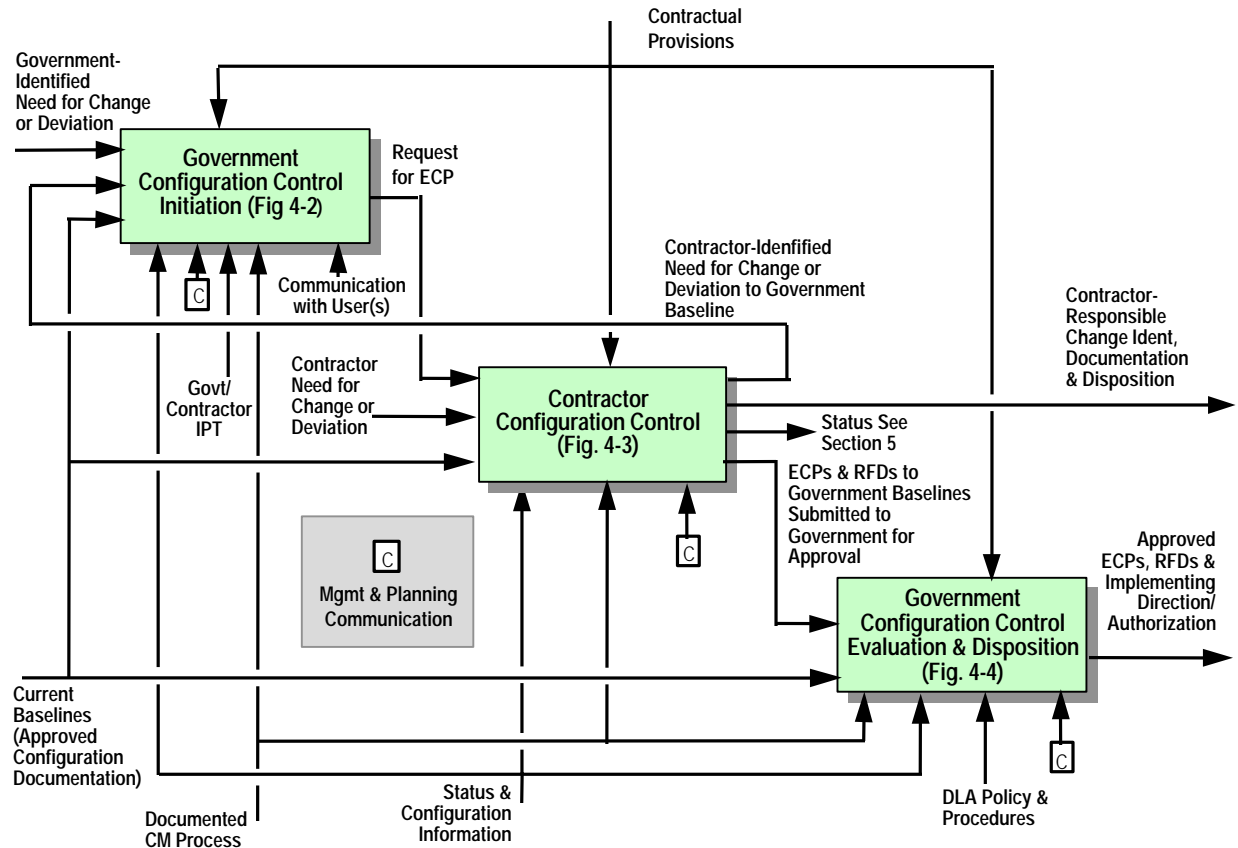


Figure 4-1. Activity Model: Configuration Control Process

The first segment, Government Configuration Control-Initiation, reflects the portion of the process prior to Government request for a contractor Engineering Change Proposal (ECP). This activity occurs:

- When the need for a change is originated by a Government activity (including field and operations activities)[**Details: 4.2.1.1**]
- As a result of input from the contractor that a Class I Change to a Government controlled baseline is needed [**Detail: 4.2.1.1**]
- After configuration documentation that will be affected by the proposed change has been approved and is incorporated in the current baseline controlled by the Government

Changes may be needed for a variety of reasons, such as to counter new threat, insert new technology, respond to technical and operational tests and evaluations, or correct problems. As shown in **Figure 4-2**, the Government activity responsible for configuration control confirms the need for change, sets thresholds for performance, cost and schedule for the proposed change, makes a determination that the change is technically achievable and affordable (based on current information and contractor¹ interface, where appropriate) [**Detail: Appendix G**], and prepares a request for the contractor(s) to prepare an ECP. One of the most significant contributors to configuration control efficiency and effectiveness is clear and concise communication between the Government and the contractor prior to the formal request for ECP. Ideally this occurs in an integrated product team environment.

Figure 4-3, reflecting the second segment of **Figure 4-1**, models the contractor's configuration control process. Contractor configuration control is invoked as each item of configuration documentation is released by the contractor. Ultimately contractor configuration control is applied to the complete set of configuration documentation including Government baselined configuration documentation at the performance or detailed

¹ As stated in Section 1, the term contractor as used in this handbook also refers to a Government cognizant field activity who may be tasked to prepare an ECP

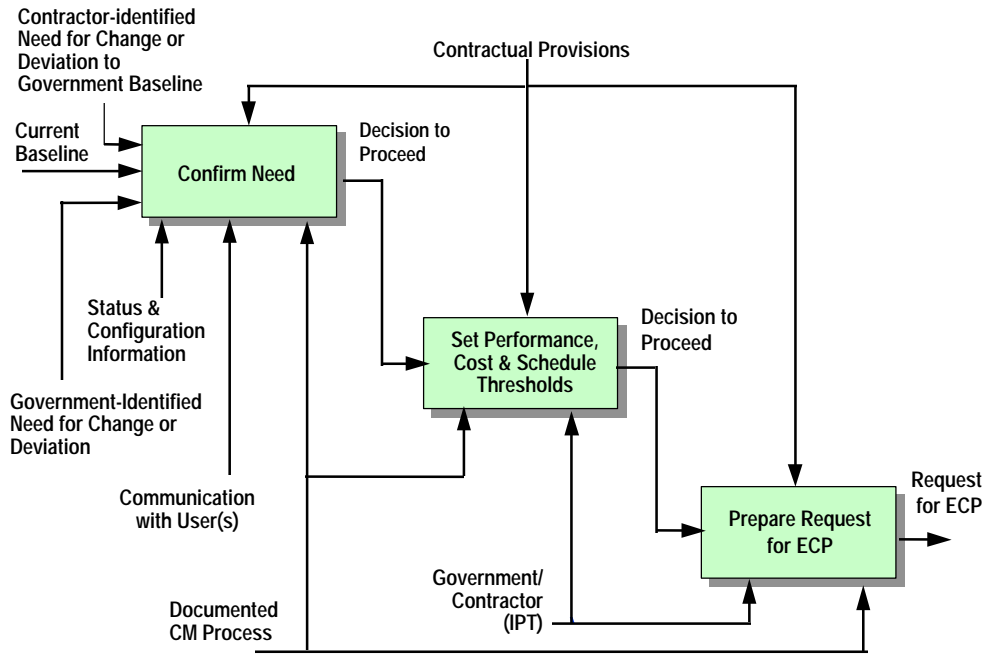


Figure 4-2. Activity Model: Government Configuration Control: Change Initiation

specification level, as applicable, and the design solution embodied in engineering models and drawings. The contractor responds to Government ECP requests and to internally generated requests for design changes or deviations (RFD). The contractor evaluates each proposed change or deviation request and documents its impact to the development and supportability of the CI, determines the applicable level of review and approval required, and ensures that a specific decision about the viability of the change is made by the applicable configuration

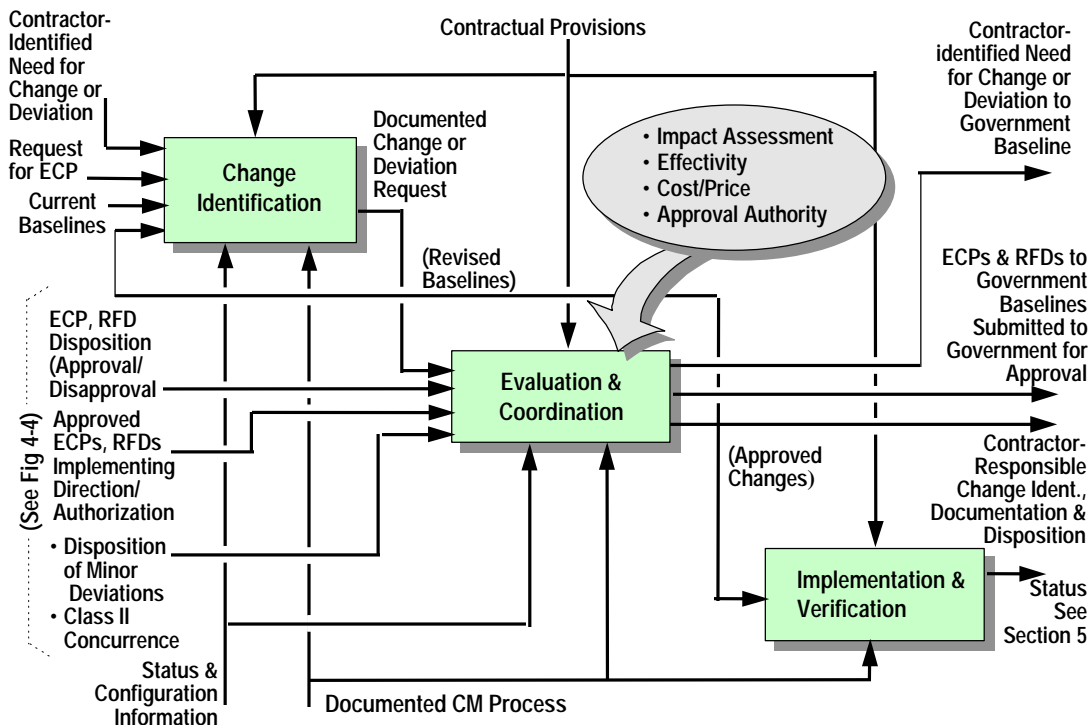


Figure 4-3. Activity Model: Contractor Configuration Control

control authority before it is implemented. ECPs and RFDs requiring Government review and/or approval are forwarded in accordance with contractual requirements. The change approval decision is made by the Government when:

- The change is to a requirement of a baselined performance level configuration document controlled by the Government, or
- A change to a configuration document controlled by the contractor has an impact on specified performance, supportability and other contractually specified requirements pertaining to the CI and documentation controlled by the Government.

The contractor makes the decision when the change is to items/configuration documentation for which it is the configuration control authority, provided those changes do not impact the Government's baselines.

Figure 4-4 models the third segment of **Figure 4-1**, covering the portion of the process concerned with Government review and disposition of contractor submitted ECPs and RFDs. It illustrates local Government representative review and concurrence with class II changes and minor deviations (where such action is contractually required) and its endorsement (or non-endorsement) of class I changes and major/critical deviations. The Government configuration control activity (typically a secretariat) prepares for the configuration control board by coordinating the proposed change with all affected parties, receiving technical concurrence and cost and schedule commitments, and by placing the change/deviation on the CCB calendar (in concert with its readiness and the urgency of the change). The CCB then reviews the proposal and the implementation commitments and either approves or disapproves them in accordance with the procuring activity's policy. As a result of the CCB decision, implementing direction is given, typically in the form of a CCB directive. Actions directed by the CCB include both contractual actions and tasking orders for Government activities, as applicable. In response to a CCB Directive, the Government contracting office prepares and negotiates a contract modification to authorize the contractor to proceed with implementation of the approved class I ECP or major/critical deviation.

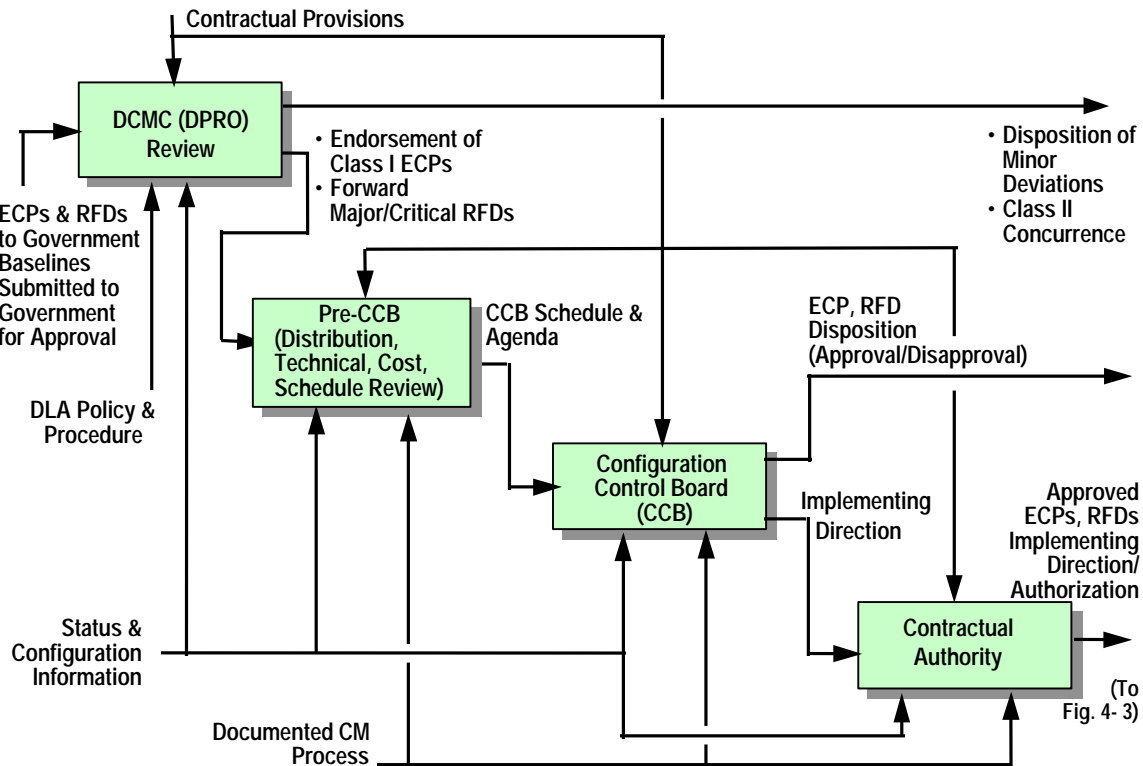


Figure 4-4. Activity Model: Government Configuration Control: Change Evaluation & Disposition

An effective, well defined configuration control process assures the government program office that all changes to government controlled baselines, no matter how small or seemingly insignificant, are reviewed by the applicable configuration control authority. Without an effective configuration control process the program office runs the risk of delivering CIs with configurations that:

- Are technically inadequate and fail to meet specified performance requirements
- Are not logistically supportable
- May be unsafe
- Result in wasted resources, and
- Do not provide an accurate historical record as a basis for future change.

4.1.1 Configuration Control General Concepts and Principles

As described in 4.1, configuration control of baselined configuration documentation is an integrated change management process including both performing activity (generally a contractor) and tasking activity (generally the government) responsibilities for change preparation, justification, evaluation, coordination, disposition, and implementation. Through the configuration control process, the full impact of proposed engineering changes and deviations is identified and accounted for in their implementation.

The configuration control process evolves from a less formal process in the early phases of a program to a very disciplined and formal process during the EMD and P,F/D&OS phases [See Figure 1-1 and 2-5]. In the concept exploration phase the configuration control process is employed in support of systems engineering to make sure that the correct version of documents which communicate technical decisions and definition of pertinent study parameters are disseminated and used by all personnel. In addition, the process makes affected parties aware that a change is being developed and enables them to provide pertinent input.

In the Program definition and Risk Reduction Phase, when the program definition documents are being developed, the configuration control process is also less formal. As part of the systems engineering control process in this phase, there may be several requirements definition baselines established for convenience in assuring that all program participants are “on the same page.” A configuration control procedure is helpful in this phase for the review and coordination of changes to the evolving system level specifications. It can also serve to maintain the Government/Contractor information interchange efficient and manageable by providing:

- The identification, documentation, dissemination and review of changes
- Appropriate versioning of files and revision of documents
- A release process to assure that each revision/version reflects the applicable changes

During EMD and P,F/D&OS phases, a formal configuration control process is essential. The informal document change control that was practiced during Phases 0 and I is insufficient for Phases II and III. As the product is being developed and produced in these phases, configuration control focuses on the documentation defining performance, physical and functional characteristics and the configuration of the product. Configuration control is a management process using contractual (Government) and internal (contractor) configuration baselines as references for managing change. Within this context, however, there are several configuration control complexity levels. When viewed at the macro level, described by the activity models (Figures 4-1 through 4-4), the process:

- Addresses the baseline documentation
- Determines which documents are impacted
- Proposes a change covering the impacts to all affected elements, and
- States when, where, and by whom the documentation will be updated and the change will be incorporated in the product and in all supporting elements.

While this top-level macro view appears simple and straight forward, a micro level view of the configuration control process can be considerably more complex. The micro view reveals the process layer dealing with what must be done to change each affected element, and thus with a wide variety of considerations such as data rights; approval authority, document custodians; design, release, production, installation and testing organizations; contractual and interface relationships. [Details: 3.3, 3.4, 3.7, 3.8, Section 7]

To effect change to a product, the first step is the revision of the documents defining the product. The concepts discussed below, some of which are introduced in **MIL-STD-2549**, facilitate accomplishing this step, using automated tools such as a CM AIS. This handbook views these concepts from both program management (macro) point of view and the document control (micro) point of view expressed in MIL-STD-2549.

4.1.1.1 Current Authority. On the micro level, if an ECP proposing a change to a product impacts several documents, the change proposal, evaluation, and implementation must consider:

- Who is the contractual authority to approve an ECP? This is the product configuration control authority
- Who has the right to approve revision of each document affected by an ECP? This is the current document change authority.
- Is a related ECP required from a document change authority organization before the configuration control authority for the product can approve an ECP for the product?
- Are there other Government or industrial activities involved because the product has multiple users? These are application activities. Is one designated the lead application activity?

a. Configuration Control Authority. The contractual configuration control authority approving the implementation of a change to a product (system/CI) may initially reside with a contractor or with the Government. It may transfer from the contractor to the Government, or may continue to reside with the contractor throughout the life cycle of the CI. This authority is technically responsible for the performance of the product as well as fiscally responsible for funding changes to the product.

The level of Government configuration control is generally determined as part of CI selection. **[Details: Refer to 3.3.1, 3.3.2]** During an acquisition program, it is the levels at which the Government specifies, contracts for, accepts and plans to logistically support the individual components of a system or CIs. Government configuration control always addresses the functional baseline and the allocated baselines established for lower level CIs whose specifications have been issued by, or approved by the Government **[Details: Refer back to 3.5.2]**. Similar and related contractor configuration control practices also apply to CIs and component parts below the level of Government configuration control.

The contractual configuration control authority addresses the total set of documents that are baselined for the product controlled by that authority for a specific contract. This authority can be the Current Document Change Authority (CDCA), described in b. below, for individual documents which require change (e.g., a system or CI performance specification). If it is not the CDCA for a given document, it does not have the authority to approve a proposed change to that document, and therefore must solicit ECP approval from the applicable CDCA, or select an alternate design.

b. Current Document Change Authority. The concept of current document change authority (CDCA), a term established in MIL-STD-2549, is an expression of a relationship which has always existed. Before the need to manage configuration documentation with an automated information system this concept was not clearly articulated but was embodied in the terms “Originating Design Activity” and “Current Design Activity.” **[Ref: MIL-STD-100]** However, the definition of those terms refer to specifically to design documents, e.g., engineering drawings, as opposed to all documentation, and they also include custodial as well as design responsibility.

The CDCA on the other hand, pertains to specifications or any other type of document and is independent of the organization that physically maintains and stores the document. The CDCA is the organization that has the decision authority over the contents of the document, reflecting proprietary or data rights to the information that the document contains. The CDCA may be a Government activity or a contractor, and the authority may be transferred. However there is only one CDCA for a document at a time.

The scenarios in the box on the next page illustrate the logic of CDCA designation:

Scenario

1.	An Engineering and Manufacturing Development (EMD) phase contract: the contractor develops a CI to a Government-approved performance specification; design documentation is in contractor format, and the Government has not contracted to control the product baseline (PBL) or order a technical data package (TDP): <ul style="list-style-type: none"> The Government is the configuration control authority for the product and CDCA for the Performance Specification The contractor is the CDCA for the design documentation.
2.	An EMD contract similar to 1, except the Government establishes the PBL and acquires the TDP: <ul style="list-style-type: none"> The Government is the configuration control authority for the product and CDCA for the Performance Specification The contractor is the CDCA for the design documentation The Government becomes the configuration control authority for the detailed design upon establishment of the PBL The contractor continues as the CDCA for the design unless the Government has contracted for and takes delivery of the original drawings. In the latter case, the Government or its agent becomes the current design activity (adds Government CAGE Code) and CDCA.
3.	A production phase contract, where EMD was to Scenario 1: the Government orders the TDP at the end of production to guarantee long term support and to reprocur the item and/or its spare parts from sources other than the original manufacturer: <ul style="list-style-type: none"> The Government is the configuration control authority for the product and CDCA for the Performance Specification The contractor is the CDCA for the design documentation At the end of Production, the contractor delivers a TDP in accordance with the CDRL This may be a copy or the original. If the original of the TDP is submitted for approval, and a Government PBL is established, the Government becomes the configuration control authority/CDCA for the design from the point of TDP approval (except for those documents and designs which are the property of others) If copies of the TDP are submitted for information, the Government does not have approval right to configuration changes that are approved by the contractor after completion of production; the contractor remains the CDCA for the design.
4.	An Engineering and Manufacturing Development (EMD) phase contract: the Government contracts for a contractor to develop a CI to a Government-approved performance specification; Government is to be the design activity (i.e. Government CAGE code) and the Government orders a technical data package (TDP) and will establish and control the product baseline (PBL): <ul style="list-style-type: none"> Government is the Configuration control authority and the CDCA for all the specifications and design documents, except those designs and items that are the property of others, throughout the life of the document.
5.	An Engineering and Manufacturing Development (EMD) phase contract: the Government contracts for a contractor to develop a CI to a Government-approved performance specification; Contractor is to be the design activity (i.e. Contractor CAGE code); the Government will establish and control the product baseline (PBL), orders a technical data package (TDP) for approval, and delivery of drawing originals:: <ul style="list-style-type: none"> The Government is the configuration control authority for the product and CDCA for the Performance Specification The contractor is the CDCA for the design documentation The Government becomes the configuration control authority for the detailed design upon establishment of the PBL The Government or its agent becomes the current design activity (adds Government CAGE Code) and assumes the role of CDCA for the design documents, except those designs and items that are the property of others, upon approval of the TDP and delivery of the original drawings.
6.	Contractor developed item with his own funds and claims proprietary rights (commercial item): <ul style="list-style-type: none"> Contractor is the configuration control authority for the CI and CDCA for the configuration documentation, over the entire life of the CI. Government is an Application Activity

c. **Application Activity.** There may be multiple configuration control authorities for a product with more than one user; each being a configuration control authority for a given contract. If the configuration control authority for one contract is the CDCA for the system/CI Performance specification for the product, then the other configuration control authorities are considered application activities because their authority extends only to the use of the product and its documentation. They cannot authorize change to either, but they may participate in the change control process if asked for input by either the configuration control authority that is the CDCA, or by the Government lead application activity.

It has always been desirable for the contractor for an item to deal through a single Government focal point for the coordination of changes. Often this has not been the case. Each Government activity typically considered their authority paramount and did not always recognize that there were multiple application authorities. As multiple use of items continues to proliferate, there must be a simple logical method of distinguishing control authority from use authority, and of communicating and coordinating changes that may have multiple use impact. The following Application Activity designations are used for this purpose in MIL-STD-2549:

- Application activity (AA) - a user of a document who is not its CDCA
- Government lead application authority (GLAA) - the Government acquisition activity that has been designated as the lead for the acquisition of the item. When assuming this role, the GLAA consolidates recommendations from all the Government application activities and is the single point of contact within the Government for coordination with the Government/Contractor CDCA.

4.1.1.2. Change Classification. Change classification is a shorthand method for indicating the change processing and/or approval method. ECPs required to be submitted to the Government are classified as either class I or class II. A class I ECP is approved by the Government's Configuration Control Board and authorized with a contract modification. A class II change, on the other hand, is typically reviewed for concurrence in classification by the local government representative, unless otherwise specified in the contract². Unless a government representative is identified in the contract (normally a person from the procuring activity), the Contractor (or ECP originator) is responsible for assigning change classification. The criteria for ECP classification is now detailed as part of the change classification data element definition in MIL-STD-2549. **[Detail: Activity Guide: Table 4-2].**

In performance based acquisition, the definition of both class I and class II changes have been modified to reflect application only to changes that impact Government approved (baselined) configuration documentation. Changes to contractor baselined documentation must all be reviewed by the contractor to determine if they also impact government performance requirements and support activities.

The classification factors apply only to engineering changes proposed to approved configuration documentation. Although adding a statement of work task (such as an environmental impact analysis) may require a contract modification and could result in increase costs to the government, it is not considered a class I engineering change because neither the design nor the configuration documentation is affected. **[Detail: Activity Guide: Table 4-2]**

In classifying a change, consideration must be given to more than the form, fit, function or interface characteristics of the CI itself. All of the ECP classification factors **[Refer to Activity Guide: Table 4-2]** must be considered prior to classifying an ECP. The factors include many support, operational, and training considerations. For example, a proposed design change to an electronic circuit card would not be a class I change by itself if the contractor is CDCA for the card's documentation. But if the redesign requires a change to automatic test equipment or support software for which the Government is responsible, the change must be classified as a class I ECP and processed accordingly. It should be noted that class I changes of this type which are mistakenly classified as class II or considered within the contractor's CDCA responsibility, could result in significant operational use and/or logistic support problems and increased costs to the Government.

All applications of the affected CI must be considered when classifying a change, e.g., ECPs initiated against a CI being manufactured by more than one contractor, a CI which has multiple applications or is used by more

² Class II concurrence authority has been delegated to contractors in many cases as the result of single process initiative (SPI) proposals. However, Class II approval authority can only be delegated to contractors for documents for which they are the CDCA

than one tasking (application) activities. The classification criteria must be applied to all of the CI applications via coordination between the affected activities.

4.1.1.3 Configuration Control Board (CCB). Government CCBs are established for major acquisition programs. (Contractors also employ a similar process for their internal configuration control.) CCBs are usually comprised of the joint command or agency body chartered to act on class I ECPs and requests for major or critical deviations. The program manager is normally the chairperson of the CCB and makes the decisions concerning all changes brought before the CCB. The CCB is a program management process used by the program manager to ascertain all the benefits and the impacts of the change before the decision is made. Once the CCB Chairman has rendered a decision, a CCB directive, or equivalent letter/memorandum, is signed by the CCB chairperson, directing the appropriate implementing actions to be completed.

a. CCB Authority. Each CCB has a limited authority to approve changes based on the following factors:

- Authority may be limited by a higher level CCB, where there is a hierarchy of CCBs on a complex project
- A CCB, within an organization that is not the CDCA for a document, does not have the authority to approve a change to that document.
- If the CDCA is the organization that proposed the change to the CCB, the CCB approves the funding and incorporation of the change to the product, while the CDCA approves the change to the document.
- If an organization that is not the CDCA for a document proposes a change to a CCB organization that is also not the CDCA for the document (i.e., an AA CCB), the AA CCB does not have the authority to approve the change.
- AA CCBs may review proposed changes and make recommendations to the CDCA. The AA CCB can decide only to adopt (or not adopt) a change that is approved by the CDCA.
- CCB approval of an ECP must sometimes be withheld pending approval of specific document changes by the CDCAs for those documents
- CCB approval may sometimes be withheld pending receipt of user positions from all Government AAs indicating that they will adopt the change. As stated in 4.1.1.1.c, multiple AA positions should be coordinated by a GLAA.

b. CCB Membership. The membership of the CCB is normally comprised of the key functional or subject matter experts from the Government organization, e.g. Integrated Program Team (IPT). The members are responsible for advising the CCB chairperson. Other functional personnel may be included, as may be dictated by the change and/or program requirements including representatives from other DoD services (for joint service programs) and other countries (for multi-national programs). CCB membership should consist of, but not be limited to representatives from logistics, training, engineering, production management, contracting, configuration management and other program related functional disciplines. CCB membership is maintained by CCB charter.

c. CCB Charter. CCB charters are normally approved through the government procuring activity official administrative channels. All CCB members must be present at each CCB meeting and should be familiar, from their functional perspective, with the changes being considered. CCB members are obligated to make their position(s) known to the chairperson; and ultimately to signing the CCB directive/order (when required) noting their agreement or disagreement with the decision. To sign the CCB Directive (CCBD), a person must be the primary (or alternate) CCB member designated by the CCB charter.

d. CCB Operating procedures. The procuring activity's CM office should publish procedures for CCB operation so that all members understand its importance to the acquisition process. A CCB secretariat schedules meetings, distributes agendas, records CCB decisions, and distributes minutes and directives to parties who are assigned implementing action(s) or have a need to know. The CCB operating procedures should also define target processing times for ECPs to assure timely staffing, approval and implementation.

4.1.1.4 Effectivity. The effectivity of an ECP identifies the quantity or range of CIs which are to be changed, including both production incorporation and retrofit of delivered CIs. The establishment of ECP effectivity requires the procuring activity to consider such factors as the following:

- **Urgency** - Correcting a deficiency involving personnel safety may be significant enough to override all other considerations, even concurrent support. If operating limitations are placed on equipment pending resolution of a safety issue, operational effectiveness can be severely restricted
- **Inventory** - Parts and materials on hand must be considered; a decision based on cost and operational trade-offs must be made either to use existing materials to depletion, or to scrap current inventory. This applies to both contractor inventory as well as Government stocked spare and repair parts
- **Configurations** - One of the key configuration management objectives is to minimize the number of different CI configurations that must be simultaneously supported, particularly if the different CI configurations require different or updated operational software, support equipment, support software, spares, training or publications. Since all existing CI configurations cannot often be updated simultaneously, careful consideration must be given to either delaying or accelerating the incorporation of the change to minimize the impact. Setting effectivity to a future defined block of the CIs may be one solution. Combining or packaging a number of software changes into the next version may be another, etc.
- **Lead Time** - There are many lead times to consider when identifying the effectivity for a change. The manufacturing/procurement lead times necessary to complete non-recurring design effort, procure parts and materials and incorporate the change both in production and/or retrofit must be considered. The administrative lead time required for processing the change for approval is also paramount. The Government and contractor bear a responsibility to avoid delay in change processing particularly when there are large quantities of the CI in production and in the operational inventory that must be retrofitted. The cost of delaying a decision may result in additional obsolete configurations being delivered that will have to be retrofitted. Often, the recurring cost of replacing components in production is merely the substitution of one assembly of equal or lower cost for another; whereas retrofitting the same change involves the cost of both assemblies, as well as the additional cost of disassembly and replacement.
- **Timing** - The effectivity may need to be selected so that a given operational capability will be available at a given time or for a specific event such as a planned deployment of forces or a training exercise.

4.1.2 Configuration Control General Activity Guide

Table 4-1 provides an activity guide for the evaluation of a configuration control process.

Table 4-1. *Activity Guide*: Configuration Control Process Evaluation Checklist

✓	Criteria
	1. Documented Process
	a. Does the contractor have a documented Configuration Control process?
	b. Does the contractor follow his documented process?
	c. Are contractor personnel from all disciplines involved in the process informed and knowledgeable about the procedures they are supposed to follow?
	2. Change Identification and Documentation
	a. Is each ECP and Deviation assigned an appropriate identifier?
	b. Are requests for change classified to identify the appropriate change approval authority?
	c. Do the contractor's change classification rules match or clearly map to the Government's change classification rules (see table 4-6)?
	d. Are the criteria for determining what must be submitted to and approved by the Government clear and unambiguous?
	3. Engineering Change Proposals
	a. Are ECPs documented sufficiently to permit an informed evaluation and assessment of the impact of the ECP?
	b. Do ECPs clearly define the proposed technical approach and the proposed effectivity? Does the effectivity include production and retrofit, if applicable?
	c. Are proposed ECPs coordinated with and evaluated by representatives from all impacted areas?
	d. Does the contractor employ a Configuration Control Board (CCB) or electronic equivalent?
	e. Are all technical, support, schedule, and cost impacts identified before the CCB decision is made?
	f. Is the CCB a non-voting board? Do the members have the opportunity to document their concurrence or non-concurrence prior to board decisions?
	g. Does the CCB chairperson have sufficient authority to commit the resources necessary for change implementation?
	4. Change Implementation and Verification
	a. Does the contractor implement approved changes in accordance with documented direction?
	b. Is change implementation verified? Is the verification sufficient to ensure CI consistency with its documentation?
	c. Are changes to all affected commodities tracked and verified?
	5. Requests for Deviation
	a. Are RFDs documented sufficiently to permit an informed evaluation?
	b. Are RFDs categorized/classified (e.g., critical, major, minor) to facilitate determination of the appropriate processing and level of approval authority?
	6. Metrics
	a. Are statistical records for changes and deviations processing being maintained?
	b. Is the processing data being reduced to meaningful measurements that are used to maintain and improve the process?

4.2 Engineering Change Proposal

An Engineering Change Proposal (ECP) is the management tool used to propose a configuration change to a CI and its Government-baselined performance requirements and configuration documentation during acquisition (and during post-acquisition if the Government is the CDCA for the configuration documentation).

4.2.1 ECP Concepts and Principles

The following paragraphs define uniform concepts and principles by which the processing of ECPs is conducted. These standard ground rules are necessary to assure that there is a consistency and orderly process that can be expeditiously accomplished by all parties. The Government no longer imposes rigid DD-forms requirements, however MIL-STD-2549 identifies the data fields of information that constitute an ECP, and provides clear unambiguous definition of the data elements that should populate those fields when applicable to a given ECP.

The concepts in this section apply to class I ECPs, except where specifically identified as applicable to class II ECPs.

4.2.1.1 ECP Initiation. The initiation of an ECP begins at the government's request unless for one or more of the reasons cited in paragraph b. below. Since most ECPs occur in a sole source environment, the initiation of an ECP should be a well planned and coordinated effort between the government and contractor. A clear mutual understanding of the ECP objective, technical scope and the Government's performance, cost and schedule constraints shortens the lead time for ECP preparation. It also results in a complete and comprehensive proposal to facilitate timely and effective implementation. As with most processes, the three C's: Communication, Cooperation and Coordination are the keys to assuring successful change processing.

The "ECP Management Guide," [Detail: Appendix G] has been developed to assist both the Government and contractor during the request, preparation, approval and implementing phases of an ECP. It provides checklists to aid in the timely identification and coordination of essential technical information required for decision making in all three stages of the ECP process. It also fosters the integrated product and process team concept.

a. Solicited ECPS. Whenever the government identifies a need or requirement to change a CI and its configuration documentation a Class I ECP is formally requested from the contractor. A request for an ECP is coordinated with the applicable government Contracting Officer prior to being released to the contractor. [Refer to: Check List (A) of Appendix G]

b. Unsolicited ECPs. As a general rule, unsolicited Class I ECPs are discouraged. However, at the discretion of the procuring activity, a preliminary ECP may be submitted to allow evaluation of the desirability of expending resources to fully document a proposed change. Changes that impact the following areas are instances where unsolicited ECPs may be justified:

- Safety
- Compatibility.
- Correction of Defects.
- Survivability.
- Security.
- Product improvement(s) that may significantly reduce life cycle costs, including Value Engineering Change Proposals (VECP) consistent with the DFAR Value Engineering clause of the applicable contract
- Technology improvements

4.2.1.2 ECP Preparation and Submittal. Formal and preliminary ECPs are prepared and submitted to the Government in accordance with the configuration management requirements of the applicable contract SOW and associated Contract Data Requirements List (CDRL), DD Form 1423 citing the latest approved Data Item Description (DID) for submittal of ECP data. The contract CDRL should provide information on submittal and distribution of ECPs for Government review and processing.

The contractor (ECP Originator) should notify the Government immediately by electronic message (e.g. E-mail, Fax) when the need for an emergency or urgent priority ECP is determined. Follow-up to a message ECP should be in the form of a formal ECP submittal, within 30 days. However when this is impracticable, a preliminary ECP may be used as an interim measure. Both the preliminary ECP (if used) and the final ECP resulting from a message ECP would be identified as revisions of the initial message ECP. [Detail: Activity Guide: Tables 4-3 and 4-4]

a. Automated Processing of ECPs. If the Government has established a Government Configuration Management Automated Information System (CM AIS) system, or employs the DoD Standard Automated Change Control System (known as MEARS) as a stand-alone system, the contract data requirement for ECPs should request either the digital submittal of ECP data or population of the DoD data base directly by the contractor.

- The Government has specifically expressed its preference for a CM AIS in **MIL-STD-2549**.
- All ECP fields of information are defined in the MIL-STD-2549 data dictionary. [Ref: MIL-STD-2549 Appendix C] To provide communication between a contractor and the (planned) standard Government CM AIS, will require the ECP data to use these defined data elements.
- To use MEARS³ as a standalone system, software must be provided to the contractor

b. ECP Content by Program Life Cycle Phase. Pertinent data fields of information (ECP data elements) that are to be provided by an ECP should be identified as described in MIL-STD-2549. Only the data fields that are populated need be provided with the ECP. Identifying the MIL-STD-2549 data fields will enable Government and the various commercial configuration management information systems to store and coherently display the ECP data. A significant advantage of using electronic commerce over paper forms is that each topic may be addressed in its entirety without having to meet paper form block limitations. MIL-STD-2549 data element definitions provide fields sizes that rarely limit ECP information.

Obviously those key data fields which identify and describe the change are mandatory in any ECP. Common sense and the current context and environment of the program for which the ECP is being submitted dictate which fields are to be populated. The typical content of an ECP may vary considerably during the CI's life cycle, and because DoD Directive 5000.1 gives Government Program Managers latitude in identifying the phases that they will employ, no two programs will necessarily be the same. The content guidance provided herein [Detail: Activity Guide: Table 4-6] reflects the general variability of ECP content that can be expected.

4.2.1.3 ECP Supporting Data. Supporting data should include, where necessary, supplementary information to support the change description and justify the need for change. Test data, analyses and other technical documentation providing supporting rationale for assertions made in the ECP, and upon which the configuration control authority can base its acceptance of the proposed change, can be included to the extent that the originator feels is necessary. In many cases, the proposed change or its justification will be easier to understand if "marked-up" copies or draft revisions of the TDP element (such as a "redlined" copy of a portion of a specification or an interface drawing, or a draft table providing new values to be included in a data base) are also provided as a part of the ECP package.

4.2.1.4 Review and Dispositioning ECPs. In order to facilitate dispositioning ECPs affecting documents for which the Government is CDCA, contracts should identify the government representative(s) responsible for dispositioning both Class I and Class II ECPs. Where the Government is an Application Activity (AA), or in a performance based acquisition, where the Government is not CDCA for the design documentation, contracts should clearly specify Government and contractor responsibilities for Class I ECPs and RFDs affecting Government baselined performance specifications. This can be accomplished by incorporating a special configuration control clause in the contract similar to the example in the box on the next page. Guides for the dispositioning of Class I and Class II changes are provided in 4.2.2. [Detail: Activity Guide: Table 4-7] Key aspects of this process are highlighted, as follows:

³ The OPR for MEARS is Commander, US Army MICOM, Attention: AMSMI-MMC-LS-SA (Mr. Mark Moe) Redstone Arsenal, Alabama, 35898-5238, DSN 746-9513

Example:

CONFIGURATION CONTROL PROCEDURES FOR ENGINEERING CHANGE PROPOSALS, AND DEVIATIONS -
(STATEMENT OF WORK) (date)

(a) Any Engineering Change Proposal (ECP) or any Request for Deviation affecting an item being acquired under this contract shall be in accordance with attachment (), contract statement of work (SOW) paragraph(s) _____. Quantities and distribution, or *electronic delivery/access*, shall be as stated on DD form 1423 (Contract Data Requirements List) or distribution list attached hereto.

(b) No Class I engineering change shall be implemented until authorized by the Contracting Officer (CO).

(c) Each Class II engineering change shall be submitted to the cognizant Administrative Contracting Officer (ACO), or in the absence of such ACO, by (Insert applicable CFA, etc.) for concurrence in classification.

- or -

Each Class II engineering change shall be dispositioned by the Contractor.

(d) No major or critical deviation shall be effective until authorized in writing by the CO.

(e) Minor deviations, requested prior to manufacture, shall be authorized (or disapproved) by the ACO, or in the absence of such ACO, by (Insert applicable CFA, etc.).

- or -

Minor deviations, requested prior to manufacture, shall be dispositioned by the contractor

(f) Minor deviations to manufactured items shall be granted (or disapproved) by the local Material Review Board (MRB) when properly constituted, or in the absence of such ACO by _____.

(As used in paragraphs (b) and (d) of the foregoing clause, the term "Contracting Officer (CO)" means the "Procurement Contracting Officer (PCO)" or the "Administrative Contracting Officer (ACO)" if the contract provides that orders may be issued and priced by the ACO. The PCO or ACO may authorize only Class I engineering changes and major deviations which have been approved by the Procuring Activity Change Control Board (CCB). The PCO and ACO may authorize only critical deviations involving safety that have been approved by Procuring Activity Change Control Board (CCB) and by the Commander, _____ Systems Command.

a. Dispositioning Class I ECPs. Class I ECPs must be dispositioned (approved or disapproved) for implementation by a properly constituted Government Configuration Control Board (CCB). [See 4.1.1.3.a.] After the CCB direction is issued, it is important to proceed expeditiously with the "definitization" process (obtaining a pricing proposal, auditing, fact finding, and negotiating the final price) for this change and issuing a supplemental agreement. Until the contract modification is received and bi-laterally agreed to by the Government and the contractor, the contractor is not authorized to proceed with the implementation of the proposed change.

The contractual approval or disapproval of an ECP should not be confused with the acceptance and approval of the ECP as a data deliverable. Approval of the ECP data delivery required by CDRL/DD Form 1423 signifies only that the ECP satisfies the requirements of the ECP DID and is considered acceptable for government processing. Acceptance of the data deliverable does not signify "technical approval" of the change proposed by the ECP and should not be interpreted as authorizing the performing activity(s) to proceed with the work proposed by the ECP.

All ECPs should be dispositioned by the Government as expeditiously as possible. The ECP indicates a date by which contractual authorization is required. This date should normally be proposed by the contractor to allow sufficient processing time by the Government. In some cases, expedited processing may be necessary in order to minimize the cost of the change or to enable it to be incorporated in time to satisfy an operational need. Since certain critical factors (such as safety or national defense preparedness) may be involved, it is important that the Government proceed with all due speed, but it is also important to ensure that proper priorities and need dates are being specified.

Because there is considerable urgency involved in effecting the changes proposed in urgent and emergency ECPs, the contractor normally specifies an authorization suspense date that is very close to the submittal date (e.g. 48 hours to make the technical decision on an emergency ECP and 30 calendar days to make the decision on an urgent ECP). [Detail: Activity Guide: Table 4-5.]

When the urgent or emergency priority is properly used, the contractor must be authorized to proceed with implementing the change as quickly as possible. Under these circumstances, it is often necessary to utilize a unilateral change order to the contract (or contracting officer letter) to provide official authorization to proceed. If the change order is to be used, a "not-to-exceed" price quotation (a "not-less-than" price for cost reduction ECPs) would be required to set a limitation on the price impact of the change activities to be accomplished. After the change order is issued, it is important to proceed as expeditiously as possible with the normal "definitization" process to minimize the risk of related price increase (or to maximize the related savings) resulting from the change.

VECPs are subject to essentially the same CCB process as other ECPs. Under the FAR clause, the Government is entitled to reimbursement of expenses incurred in processing an approved VECP before any cost savings are shared out to the contractor. Therefore, the tasking activity must develop auditable government cost information so that the complete monetary impact of the VECP can be evaluated. Any delays in VECP processing will typically reduce the savings benefit.

b. Dispositioning Class II ECPs. Unless otherwise specified by contract (e.g., as part of the Single Process Initiative), the government administrative contracting officer or plant representative serves as the dispositioning authority for Class II ECPs.. The default action required on Class II changes is concurrence/non-concurrence in classification only, unless the contract requires approval/disapproval. Government concurrence in Class II ECP classification normally allows the contractor to incorporate the change in the applicable CI and update its configuration documentation without any further government action or authorization being required. A non-concurrence in classification will normally result in the Class II ECP being canceled or reclassified to a Class I ECP.

The government should require approval/disapproval of class II ECPS only when the Government is the CDCA for the original drawings, or data files, and compliance with the specific detailed design is a requirement of the contract. If there is a government ACO or plant representative available, the Government tasking activity may elect to have the ACO or representative review the proposed class II changes for concurrence in classification before they are submitted to the government tasking/procuring activity (that is the CDCA) for approval [Details: Activity Guide: Table 4-7]

4.2.1.5 Implementing Class I ECPs. When ECPs are approved, change implementation to a CI being produced under contract is usually a straight forward contractual incorporation of the ECP as approved by the government CCB. CCB approval action is not to be considered authority for the contractor or tasking activity to proceed with the change.

- A CCB directive must be prepared, published and distributed. The CCB directive is identified by the CCB identifier and the change identifier. The date of the CCB directive and disposition are recorded.. Distribution should be limited to those parties required to take action to implement the change
- If implementation of the approved change is the responsibility of the contractor under the terms of a contract, the CCB approval action directs the procurement contracting officer to initiate instructions to the contractor
- If Contractor-initiated change proposals are involved, the receipt of a formal contract change for example, Standard Form 30, "Amendment of Solicitation/Modification of contract" or PCO letter (pending receipt of an amendment) shall constitute sole authority for the contractor to proceed.
- If the initiator is a government activity acting in the capacity of a contractor, the receipt of the directive/order (including funding authorizations) shall constitute sole authority to proceed with the change.

Change implementation to a CI in the inventory or operational forces will normally require the coordination of additional requirements of an implementing CCB directive (or tasking order).

- Necessary instructions and funding authorizations must be issued for the scheduled implementation of the change
- Change accomplishment reporting is directed. [Details: Activity Guide: Table 4-8]

The incorporation of approved changes should be planned so that optimum acquisition, production, tests, evaluation and operational advantages can be derived from the modified configuration. The change is effectively coordinated to ensure that the earliest possible availability and support of the CI is provided with minimum disruptive effect on planned operating cycles.

Changes shall be incorporated only after the Contract modification/PCO letter or implementing directive/order is published and logistic support is available, unless safety or critical mission requirements dictate otherwise. Unofficial or preliminary technical documents shall not be used as authority to incorporate changes.

The implementation of approved changes to a CI must always include the proposed incorporation of new and revised technical documentation. Provisions for change documentation should always be addressed by the change proposal, contract modification and/or CCB implementing directive/order. Change documentation may include such types of data as specifications, drawings, provisioning documentation, technical manuals, diagrams, sketches, parts lists, master configuration lists, computer program documentation, and test and evaluation procedures. Requirements for such change documentation may vary depending on the life-cycle phase, type and complexity of each CI and the change/modification. However, the documentation prepared for any change will normally include the following three categories:

- The documentation package (including the CCB implementing directive/order) forwarded to the change installing activities to install the change.
- The documentation required by the technical, training, maintenance, and supply management organizations to properly control and support the change.
- The documentation (e.g., technical manuals) required by the user activities to properly operate and maintain the CI after the change is installed.

4.2.2 ECP Activity Guides

The following ECP Activity Guides provide information concerning change classification, the justification for Class I ECPs, the types of ECPs, ECP priorities, ECP content, and the ECP dispositioning actions that may apply. ECPs are prepared and submitted to the government in accordance with the configuration requirements of the applicable contract SOW and CDRL/DD Form 1423. If the Government has established a CM AIS, the data requirement for ECPs should request digital submittal of ECP data or population of the DoD database directly by the contractor. [Ref: MIL-STD-2549, Appendix A] The communication between the contractor and Government CM AIS uses the pertinent data fields, arranged in the numbered sequence of the applicable MIL-STD-2549, DIP4, subpacket (4A through 4F) which cites the defined data elements of MIL-STD-2549 Appendix C. [Detail: Activity Guide: Table 4-6]

Table 4-2. Activity Guide: Change Classification

Class I Criteria: MIL-STD-2549 establishes a Data Element Definition of a class I ECP in DED 0164, as follows:

An ECP proposing a change to approved configuration documentation for which the Government is the CDCA or that has been included in the contract or statement of work by the tasking activity, **and**:

- (1) affects any physical or functional requirement in approved functional or allocated configuration documentation, **or**
- (2) affects any approved functional, allocated or product configuration documentation, **and** cost, warranties or contract milestones, **or**
- (3) affects approved product configuration documentation **and** one or more of the following:

Table 4-2. Activity Guide: Change Classification

<ul style="list-style-type: none"> (a) Government furnished equipment, (b) safety, (c) compatibility, interoperability, or logistic support, (d) delivered technical manuals for which changes are not funded, (e) will require retrofit of delivered units, (f) preset adjustments or schedules affecting operating limits or performance to the extent that a new identification number is required, (g) interchangeability, substitutability, or replaceability of any item down to non-repairable subassemblies, (h) sources on a source control drawing, (i) skills, manning, training, biomedical factors or human engineering design.
<p>Class II Criteria: <i>MIL-STD-2549 establishes the Data Element Definition of a class II ECP in DED 0164, as follows:</i></p> <p>An ECP proposing a change to approved configuration documentation for which the Government is the CDCA or that has been included in the contract or statement of work by the tasking activity, and which is not class I.</p>
<p>Guidance:</p> <ol style="list-style-type: none"> 1. The first criteria for an ECP (both class I and class II) is that it is an engineering change; it must affect approved configuration documentation. 2. Furthermore an ECP is limited to a change to approved configuration documentation that is under Government configuration control; it must require a change to a document for which the Government (tasking activity) is the current document control authority (CDCA) or which is cited in a contract. <ol style="list-style-type: none"> a. The Government becomes the CDCA in several ways: <ul style="list-style-type: none"> • Provide the document as a Government document with Government CAGE code identification • Approve a contractor document and assume control by transferring CDCA and adding a Government CAGE code to the document. [Detail: Appendix B] b. The Government cites a configuration document in the contract in several ways: <ul style="list-style-type: none"> • Specifically addressing it, as in "Provide the system in accordance with Specification Performance Specification number _____." • Defining in the SOW or CDRL, that the system performance specification, allocated performance specifications for specific CIs, and where applicable (e.g., in a design based acquisition) the product configuration documentation, shall be submitted for Government approval and configuration control. • Adding specific documents to the SOW by contract modification 3. Items (1), (2), and (3) amplify the criteria by providing specific evaluation factors to use in judging whether a proposed change to any document must be processed as a Class I or Class II ECP <ol style="list-style-type: none"> a. Item (1) - Since there are both contractor-approved and Government approved configuration documents, any change to contractor approved requirements must be examined to determine if it also impacts Government approved (CDCA or contractually cited) configuration documentation. b. Item (2) - This item concerns a change to Government controlled configuration documents, which if it did not impact cost, warranties, or milestones would not otherwise be class I. A change to contractor-controlled configuration documentation which might also affect cost, warranties or milestones, does not require a class I ECP because it is not a Government configuration control issue. — it is treated like a commercial item, i.e., the contractor is obligated to the contract provisions but can change the design of the product so long as it meets the specified performance requirements. If the contractor's design change makes the end product more or less costly, the contractor either absorbs the increase or benefits from the savings. The contractor must initiate contractual change action, outside the scope of configuration control, in order to change the contract cost, warranties or milestones. c. Item (3) provides some factors to evaluate when examining a proposed change to Government-controlled product configuration documentation. Many of these factors are specified by requirements in functional and allocated configuration documentation, covered by Item (1). A proposed change to PCD must be examined to see it impacts functional or allocated requirements.

Table 4-3. *Activity Guide: ECP Justification Codes*

Code	Title	Criteria for Assignment
B	Interface	Proposed to eliminate a deficiency consisting of an incompatibility between CIs.
C	Compatibility	<ol style="list-style-type: none"> 1. To correct a deficiency discovered during system or item functional checks or during installation and checkout and the proposed change is necessary to make the system/item work 2. Except for Government caused changes (e.g., a deficiency in GFE or GFI), the contractor agrees that effort to accomplish the change is within the scope of the existing contract; and the contract price will not be increased as a result of the formal documentation of the engineering change and corrective action in production, and to delivered in-warranty items (or as stipulated in the contract). 3. Accepting the conditions of 1. and 2. enables the contractor to expeditiously correct the specific system/item in the location where the deficiency was discovered. 4. The contractor must also notify the Government within 48 hours after determining that a compatibility change is necessary. The contractors message must define the need, identify factors that are impacted, and provide a preliminary estimate of cost and schedule. A formal ECP is required 30 days after the initial message. 5. Where further procurement or manufacturing action is necessary due to lead time considerations prior to approval of a Code C ECP, the contractor may proceed at his own risk (except where the Government caused the deficiency), after notifying the Government of the additional systems/items to be corrected.
D	Correction of Deficiency	To eliminate a deficiency. Code D is used if a more descriptive code (such as S, B, or C) does not apply.
O	Operational or Logistic Support	To make a significant effectiveness or performance change in operational capability or logistic support. Commonly known as an improvement change.
P	Production Stoppage	To prevent slippage in an approved production schedule, where delivery to current configuration documentation is impractical or cannot be accomplished without delay.
R	Cost Reduction	To provide net total life cycle cost savings to the Government and not pursuant to a contract VE clause. Code R ECPs include cost and price of the current contract(s), plus costs resulting from associated changes in delivered items (retrofit), and life cycle logistic support.
S	Safety	Correction of a deficiency that is a hazardous condition
V	Value Engineering	<p>To effect a net life cycle cost reduction, and the VECP is being submitted pursuant to the Value Engineering (VE) clause of the contract:</p> <ol style="list-style-type: none"> 1. VECPs are prepared and submitted in accordance with the Federal Acquisition Regulation (FAR) "Part 48 Value Engineering" and the Defense Federal Acquisition Regulation Supplement (DFAR) "Part 248 Value Engineering" when specified in the contract. 2. Under the incentive clause normally contracts over \$100K include either the voluntary (incentive) clause or the mandatory (program clause). 3. The effort required to develop the design change proposed by the VECP, and the effort to generate the VECP package, is accomplished entirely at the contractor's risk; only if the government approves the VECP does the contractor get reimbursed for the effort. 4. With cost reduction (R code) ECPs or VECPs under the mandatory program, the contractor is funded by the government for the development of the design and the ECP, normally based on a preliminary change document and is reimbursed for the effort whether the ECP is approved or disapproved. <p>Note: Both cost reduction ECPs and VECPs result in cost savings to the government on current contracts; they may also result in life-cycle cost savings. For both the cost reduction ECP and VECP, the contractor will share in the cost savings on current contracts based on predetermined share ratio; however, since the contractor assumed the risk in undertaking the change development, the contractor's share of the saving is much larger when VECPs are involved. Also with the VECP, the contractor may be entitled to a share of the cost savings for future contracts and for related programs according to conditions set forth in the FAR clauses.</p>

Table 4-4. Activity Guide: Class I ECP Types and Their Function

All types of Class I ECPS may be submitted to the Government electronically, the type categorization relates not to format but to give a quick indication of the intent of the ECP

Type of ECP	Function
Message	<p>Although not formally considered a type of ECP, Engineering changes with an emergency priority are often submitted in a message that provides less detail than a preliminary ECP; urgent priority ECPs sometimes are also initially documented in messages, as are notifications of compatibility changes [See table 4-3]. They should be followed up by a complete ECP package within 30 days (or a PECP, see below, if that is not practical) because they normally do not include sufficient detail for the government to determine the full impact on program requirements.</p>
Preliminary, (Type P)	<p>Preliminary ECPs are used to address the impact of proposed changes in general terms sufficient enough for the government to determine if final ECPs are warranted. They are the used by program managers when:</p> <ul style="list-style-type: none"> • The complexity of a proposed change may require extensive funding, development or engineering. • A choice of alternative proposals is appropriate; especially if a solicitation or contracting requirement is being competed between two or more contractors. • Authority is required to expend resources to fully develop a change proposal. • The government wishes to restrict configuration change activity. • Approval is required to proceed with software engineering development. • As follow-up to a message ECP when it is impractical to submit a complete Formal ECP within 30 days. This preliminary ECP would provide additional detail information supplementing the message ECP to provide the Government with a more considered analysis of the impacts and scope of the proposed change. In many cases such as Emergency, Urgent, Compatibility, the Government may have already authorized the contractor to proceed with the work based on the initial message.
Formal (Type F)	<p>A formal ECP is the type which provides engineering information and other data sufficient to support formal CCB approval and contractual implementation by the Government</p>

Table 4-5. Activity Guide: ECP Priorities

One of the following priorities shall be assigned to each Class I ECP by the originator to indicate the urgency with which the ECP is to be reviewed, evaluated, ordered, and implemented. (The proposed priority as assigned and will stand unless the tasking activity has a valid reason for changing the priority.)

Priority Code	Criteria
Emergency	<p>An emergency priority is assigned to an ECP for any of the following reasons:</p> <ul style="list-style-type: none"> (1) To effect a change in operational characteristics which, if not accomplished without delay, may seriously compromise national security; (2) To correct a hazardous condition which may result in fatal or serious injury to personnel or in extensive damage or destruction of equipment. (A hazardous condition usually will require withdrawing the item from service temporarily, or suspension of the item operation, or discontinuance of further testing or development pending resolution of the condition); or (3) To correct a system halt (abnormal termination) in the production environment such that CSCI mission accomplishment is prohibited.
Urgent	<p>An urgent priority is assigned to an ECP for any of the following reasons:</p> <ul style="list-style-type: none"> (1) To effect a change which, if not accomplished expeditiously, may seriously compromise the mission effectiveness of deployed equipment, software, or forces (2) To correct a potentially hazardous condition, the un-corrected existence of which could result in injury to personnel or damage to equipment. (A potentially hazardous condition compromises safety and embodies risk, but within reasonable limits, permits continued use of the affected item provided the operator has been informed of the hazard and appropriate precautions have been defined and distributed to the user.) (3) To meet significant contractual requirements (for example, when lead time will necessitate slipping approved production or deployment schedules if the change was not incorporated) (4) To effect an interface change which, if delayed, would cause a schedule slippage or increase cost (5) To effect a significant net life cycle cost savings to the tasking activity, as defined in the contract, where expedited processing of the change will be a major factor in realizing lower costs (6) To correct a condition causing unusable output information that is critical to mission accomplishment (7) To correct critical CI files that are being degraded (8) To effect a change in operational characteristics to implement a new or changed regulatory requirement with stringent completion date requirements issued by an authority higher than that of the functional proponent.
Routine	<p>A routine priority is assigned to an ECP when emergency or urgent implementation is not applicable, required or justifiable..</p>

Table 4-6. Activity Guide: ECP Content

MIL-STD-2549, Data Information Packet 4 (DIP 4)		MIL-STD-973 App. D	Class II Sub-packet		Class I Sub-packet			
Seq. No.	Field	Block No.	4A	4B	4C Msg	4D Prelim	4E Final-Log.	4F Final-No Log.
DIP 4 Subpacket identification								
Class II ECP: 4A - ECP contains "from-to" information 4B - ECP does not include "from-to" information			Class I ECP: 4C - Message ECP 4D - Preliminary ECP 4E - Final ECP addressing logistics impact 4F - Final ECP which does not address logistics impact					
✓ Check marks below are either mandator or optional - Refer to Table DIP4-I of MIL-STD-2549								
ECP Identification And Administrative Attributes								
2, 4- 6	ECP Identification & Rev, ECP Title	8b., D., F., 13	✓	✓	✓	✓	✓	✓
7-24	Security, Rights, Distrib, Data Rights (Basic Document Protection Data Information Packet 8A)	Marking Req.	✓	✓	✓	✓	✓	✓
Constant	ECP Type	8e.	These elements are automatic based on which sub-packet is being transmitted					
Constant	ECP Classification	5.						
28	ECP Priority	7.			✓	✓	✓	✓
29	ECP Justification Code	6.			✓	✓	✓	✓
30-31	CDCA and Effective Date	N/A	✓	✓	✓	✓	✓	✓
32-33	Current ECP Status & Date	CSA. Data	✓	✓	✓	✓	✓	✓
34	Originator (Company Name)(See Seq. 186)		✓	✓	✓	✓	✓	✓
35-37	Application Activities ⁴ & Status Of Adoption Or Rejection Of ECP Change	N/A	✓			✓	✓	
38	In Production	17	✓	✓		✓	✓	✓
39-40	Procuring Activity No. (PAN) ⁵ & PAN Yr.	2.	✓	✓		✓	✓	✓
ECP General Impact Information								
41	Baseline Affected	9	✓	✓	✓	✓	✓	✓
42-44	Primary And Related ECPs, If Any	28, 29	✓	✓		✓	✓	✓
46-48	Recurring RFD Resolved by ECP	N/A	✓	✓		✓	✓	
49	Order of Implementation (Before, With, After Other Retrofit ECPs)	46, 49	✓	✓		✓	✓	✓
Description of Change								
50-51	Description Of Change (Summary) + Link To Detail	19	✓	✓	✓	✓	✓	✓
52-53	Need For Change (Summary) + Link To Detail	20	✓	✓	✓	✓	✓	✓
57	Retrofit Required?	23, 43-48			✓	✓	✓	✓
58	Recommendation For Retrofit Kit Delivery	23c				✓	✓	✓
59-62	Ship/Vehicle Class, Location, Qty	22				✓	✓	✓
63-67	Identification of Supplemental or Affected Docs (Flag, Type, Source, Ident. Rev.	11, 12	✓	✓	✓	✓	✓	✓
68	Specific affect		✓	✓		✓	✓	✓
69-70, 72-73	Affected Part/Material/Software Ident	16, 18	✓	✓	✓	✓	✓	✓

⁴ Indicates there are several Government Activities baselining or using CI⁵ Used by Procuring Activity

Table 4-6. Activity Guide: ECP Content

MIL-STD-2549, Data Information Packet 4 (DIP 4)		MIL-STD-973 App. D	Class II Sub-packet		Class I Sub-packet			
Seq. No.	Field	Block No.	4A	4B	4C Msg	4D Prelim	4E Final- Log.	4F Final- No Log.
74-78	Effectivity	21, 23a	✓	✓	✓	✓	✓	✓
79	Forward/Retrofit				✓	✓	✓	✓
85-86	Contractor Field Service & Link	N/A				✓	✓	✓
87-93	Information about Retrofit including Work Hours To Install Retrofit Kits And Test	44-45, 47- 48				✓	✓	✓
Contract Information								
94-95	Contract /Mod	14.	✓	✓	✓	✓	✓	✓
96	Contract line Item				✓	✓	✓	✓
97	Proposed Delivery Schedule	22, 23c				✓	✓	✓
Links to Impact Description								
98	Developmental Program Requirements	34				✓	✓	
99	Trade-Offs & Alternate Solutions	35, 41				✓	✓	
100-111	Effect On Logistic Support Elements	38.a.- n.				✓	✓	
112-121	Effect on Operational Employment	39.a.- j.				✓	✓	✓
122	Effect On Operational, Maintenance Or Training Software	38.f., 40.d.				✓	✓	✓
123-124	Date contractual Authority Needed for Production, Retrofit	50.a., 50.b				✓	✓	✓
125	Consequences of Disapproval	20	✓	✓		✓	✓	✓
126--128	Effect On Product Configuration Documentation/Contract	37.a - c.				✓	✓	✓
129-138	Other Considerations	37.e, 40.b., d.-i.				✓	✓	✓
139	VECP Royalty Expiration Date	N/A					✓	✓
Estimated Net Total Cost Impact								
140-144	Total Costs/Savings	51.e, h					✓	✓
145	DoD Service component Bearing Cost	N/A					✓	✓
146-184	Cost Spreadsheet File Identification (Data Information Packet 9B)	51, 52					✓	✓
ECP Files								
185-223	Expanded Text File Data Identification (Information Packet 9B) (includes Seq. 186-Originator Address, and detail for all link fields)	Referenced Enclosures and paragraphs				✓	✓	✓
224-261	File Identification ECP Implementation Schedules (Hardware/ Software)	53-60				✓	✓	✓
262-299	Document Representation Data Identification (Information Packet 10A)	N/A	✓	✓	✓	✓	✓	✓
300	Associated NOR(S), If Applicable	11, 12	✓	✓		✓	✓	✓

Table 4-7. Activity Guide: ECP Review and Disposition Actions

ECP Type & Action	Disposition By	Governing Criteria
Class I ECP Approval	Government CCB	<ol style="list-style-type: none"> 1. CCB decision does not mean that the contractor is authorized to proceed with the performance of the change activity. 2. Additional government actions, e.g., preparation of required funding documents and authorizations are usually necessary before the contractor or Government can be told to officially proceed with the change. <ul style="list-style-type: none"> • A formal contract modification is processed by the program manager through the Contracting Officer (CO) to effect a Contractor ECP. • An approval letter from the program manager (or other representative identified in the applicable tasking directive) is required to effect a performing Government activity ECP.
CLASS I ECP Disapproval/ Rejection	Government. Program office or CCB	<ol style="list-style-type: none"> 1. When Class I ECPs are disapproved, the only government action normally required is preparation of a disapproval letter to be transmitted by the CO or other representative identified in the contract. 2. DoD policy requires that, as a courtesy, the ECP disapproval letters should provide the rationale for disapproval. 3. The notification of rejection may include direction to revise and resubmit the ECP.
Class II ECP ⁶ Concurrence or Non-concurrence	Government Plant Representative Office or other Designated Government Activity (On rare occasions, the issue of concurrence in classification is deferred to the Procuring Activity for disposition)	<ol style="list-style-type: none"> 1. Government concurrence in Class II ECP classification, when required by contract, signifies that the proposed change does not impact any of the Class I ECP criteria [Table 4-3]. 2. Government concurrence normally allows the contractor to incorporate the change in the applicable CI and update its configuration documentation without any further Government CCB action, authorization, or contract modifications being required. 3. A non-concurrence in classification may result in the Class II ECP being: <ul style="list-style-type: none"> • Revised, reclassified and re-submitted as a Class I ECP for approval • Withdrawn if the proposed change is not desired. (Non-concurrence has the same effect as disapproval because it does not allow the contractor to incorporate the change)
Class II ECP Approval or Disapproval	Designated Government Activity	<ol style="list-style-type: none"> 1. Required only when unique program requirements deem it necessary, e.g. Government approval of Class II ECPs may be required when approval/disapproval authority is assigned to a Government activity different than the Government Plant Representative Office or the procuring activity. 2. Government Plant Representative Office concurrence in classification may be required prior to submittal.

⁶ Under a performance based procurement, Class IIs need not be submitted for concurrence/approval if documentation affected is under contractor's control

Table 4-8. Activity Guide: ECP Implementation Actions

Government Activity	Implementing Action
CCB preparing Activity	<p>Prepares the change implementing directive/order designating specific responsibilities to associated activities in support of the change. These specific responsibilities may include:</p> <ul style="list-style-type: none"> • Obtaining, issuing and distributing retrofit kits, including redistribution. • Obtaining, issuing and distributing engineering and installation data packages. • Logistics, test and evaluation activity requirements.
Logistics Manager	<ol style="list-style-type: none"> 1. Distributes the preliminary directive/order for review, validation, check out and comment, revises the implementing directive/order in accordance with accepted comments, and provides the final change implementing directive/order to the ICP. 2. If the change affects hardware or firmware, prepare, or have provisioning documentation prepared and forward to the applicable Inventory Control Point (ICP). 3. Ensure that all training requirements are addressed. 4. Manage ECP Implementation when retrofit is involved
ICP	<ol style="list-style-type: none"> 1. Distributes the directive/order and associated documentation to the installing activities, supply storage points, repositories, training activities and OPR, as appropriate. 2. Provision the change (i.e., make sure the necessary spares are ordered)
Technical Data Manager	Review the proposed data revision requirements, recommend or prepare necessary revisions, and forward them as directed by the preparing activity.
Technical Manual Manager	Prepare, or have appropriate technical manual revisions prepared
Manufacturing and Development Activity	<ol style="list-style-type: none"> 1. Prepare/revise the specifications, drawings, lists, material, process and computer program specifications; computer programs, testing procedures, quality assurance procedures, classification of defects requirements, etc., needed for hardware or firmware manufacture or computer software change 2. Manufacture the changed hardware and firmware, assemble the technical documentation (retrofit instructions), hardware, firmware, and computer program change into a retrofit kit to meet the delivery schedule established by the CCB 3. Manufacture or have the spare/support parts manufactured or modified, unless they are to be accomplished by the ICP
ICP	Conduct initial check out/validation of the retrofit kit/retrofit instructions
ICP	<p>Provide each change installing activity with a work package planning document for each approved change or block of changes include, but is not limited to:</p> <ul style="list-style-type: none"> • Change implementing directive/order identification number(s). • Item identification. • Serial numbers affected. • Man hours and skill areas required to accomplish the change(s). • Any prerequisite or conjunctive changes required. • Any special instructions (for example, additional material, tools, equipment). • Funding authority. • Schedule for installation. • Training schedules and sources required to effect the change, and operate and maintain the reconfigured item.
Change Installing Activity	<ol style="list-style-type: none"> 1. Based on the work package planning document, adjust work schedule to accommodate scheduled implementation, accomplish prerequisite changes, accumulate the materials, tools, equipment, etc., to implement and support the change, and implement the change as directed/ordered.

Table 4-8. Activity Guide: ECP Implementation Actions

Government Activity	Implementing Action
	<ol style="list-style-type: none"> 2. Install change in accordance with the priority assigned and the dependency criteria documented in the implementing directive/order. 3. The change shall be installed in training and test items at the earliest opportunity. 4. Changes in priority of accomplishment, addition or deletion of changes, and change substitutions shall be avoided after the actual change work has been started. However, when installation schedules cannot be met, the installing activity shall advise the appropriate OPR and CCB so that the schedules can be revised or consideration may be given to possible cancellation of the change. 5. The installing activity shall report change implementation in accordance with the requirements of the implementing directive/order.
Reporting Activity	<ol style="list-style-type: none"> 1. All change accomplishment reports shall be initiated by the installing activity and, if different, provided to the custodian of the changed item for processing to the data repository and OPR. 2. Change accomplishment reporting shall be consistent with the applicable configuration status accounting (CSA) system. Reporting the accomplishment and effectiveness of changes in the format prescribed. Accomplishment reporting shall be done promptly so that CSA and ILS can be updated. Effectiveness reporting, when required, shall be done promptly so that continued change implementation can be reevaluated.
Data Repository	Provide for the maintenance of CSA records during the Operating and Support phase of the CI's life-cycle. [Detail: Section 5]

4.3 Request for Deviation

A deviation is a specific written authorization to depart from a particular requirement(s) of an item's current approved configuration documentation for a specific number of units or a specified period of time. It differs from an engineering change since a deviation does not effect a change to a configuration document.

Deviations are requested by contractors prior to manufacture, during manufacture, or after an item has been submitted for Government inspection and acceptance.⁷ To be tendered for delivery or to be installed in an item to be tendered for delivery, the deviant item must be suitable for use.

4.3.1 RFD Concepts and Principles

Requests for Deviation (RFDs) are most often used for production CIs delivered as a part of a production contract. They are typically associated with current, or future, delivery of items that do not, or will not, conform to the Government-baselined configuration documentation. An RFD is submitted, if during design and development, the contractor determines that for a valid reason (such as long lead time) a Government required performance attribute will not be met or verified before scheduled delivery of a limited number of production units. An RFD is also submitted when prior to the beginning of the final assembly of the first affected serial-numbered unit of a CI, the contractor finds it necessary to deliver one or more parts in a configuration other than that described by the item's baselined documentation. RFDs must pertain only to the technical requirements of a CI and not the bulk materials used in manufacture.

a. RFD Classification. RFDs are classified by their originators as either Minor, Major or Critical, unless the contract specifies that a government's technical representative is responsible for assigning the classification. The classification designations match the corresponding classification of characteristics specified in MIL-STD-2101.

b. RFD effectivity. RFD effectivity is the means used by the originator to specifically designate each separate unit (or lot of units) of the CIs that are known to be, or that will be, impacted by a proposed RFD. All units impacted by an RFD must be identified by serial number, lot number, or similar identifier that allows identification of affected units.

c. RFD preparation and submittal. RFDs are prepared and submitted to the government in accordance with the configuration management requirements of the applicable contract including the CDRL/DD Form 1423 citing the latest approved DID for RFDs. RFDs must be approved or disapproved based on the merits of the initial submittal. However, changes to a previously submitted RFD not yet approved, may be addressed as a revision to the initial RFD number.

If the Government has established a Government CM AIS system for the program, the data requirement for RFDs should request either digital submittal of RFD data or population of the DoD data base directly by the contractor. All RFD fields of information are defined in the MIL-STD-2549 data dictionary. **[Ref: MIL-STD-2549 Appendix C]** To provide communication between a contractor and the (planned) standard Government CM AIS, will require the RFD data to use these defined data elements. The pertinent data fields should be arranged in the numbered sequence provided in MIL-STD-2549 to enable Government and many commercial configuration management tools to store and display the RFD data coherently. **[Detail: Activity Guide: Table 4-9]**

d. RFD approval/disapproval decisions. A Critical RFD should not approved by the Government except under the most extenuating circumstances; and with the approval of the Activity's Commanding Officer. Critical RFDs involve a departure from requirements that have a profound impact on safety. They affect

⁷ A deviation requested during or after manufacture was formerly called a waiver. However, the processing rules for a request for waiver are identical to those for a deviation, and the terms deviation and waiver were often confused. The DoD will no longer maintain the redundant processing, forms or data fields, and instructions.

operational capabilities (including service life) of a CI, and its logistics supportability. It is therefore considered unacceptable to authorize the manufacture of a CI incorporating a Critical RFD.

Major RFDs (and critical RFD's subject to limitations expressed above) must be approved or disapproved after careful review and consideration by a government CCB. Once approved, additional government actions or authorizations may still be required. An approved RFD will normally require a formal contract modification or an approval letter signed by the government CO.

RFDs are normally processed for benefit of the contractor, since the government wants the contractually-specified configuration. The FAR (46.407) specifies that the government normally should accept "non-conforming material" only when it is in the Government's best interests, and there is appropriate consideration. Therefore, if the RFD is approved, it is imperative that the government contracting officer negotiate an equitable consideration from the contractor based on either (or both) the quantity of CIs affected by the RFD or the extent the affected CIs do not meet the government's contractual requirements. Based on the CCB review, the appropriate consideration to the government resulting from RFD approval should be estimated and furnished to the contracting office for negotiation.

When major and critical RFDs are disapproved, all that is normally required is a disapproval letter signed by the CO or other government representative identified in the contract. An RFD disapproval letter should state the reason(s) for disapproval.

Minor RFDs are normally approved by the government CAO or other representative identified in the contract. In the case of minor RFD occurring during manufacture, minor RFDs are normally approved or disapproved by a properly constituted Material Review Board (MRB) [MIL-STD-1520]. In the absence of a MRB, approval or disapproval will be made by either the government ACO or technical representative identified in the contract. In most instances, the approval or disapproval of minor RFDs, due to their simplistic nature, is not considered significant enough to require subsequent government action or authorization.

In a performance based acquisition, where the Government has not established a product baseline, minor deviations to Government approved configuration documentation should be extremely rare; most if not all should impact only contractor controlled configuration documentation and should be dispositioned using the contractors material review process.

CIs tendered for delivery with either approved Government or contractor RFDs must be suitable for their intended use without requiring subsequent repair or restoration at government expense.

e. Recurring RFDs. A recurring RFD is a repetition or extension of a previously approved RFD which applies to the same CI and contractor. Where a contractor experiences the same situation for the first time on more than one CI, each experience must be treated as a first time occurrence. Likewise, if multiple contractors experience the same situation for the first time, it must also be treated as a first time occurrence under each applicable contract.

Action should be taken by the government to ensure that approved RFDs are rarely submitted on a recurring basis. Recurring RFDs should trigger government concern that either corrective manufacturing action needs to be implemented by the contractor or that the CI's technical requirements may be too stringent. In the case of the latter, the government should request a Class I ECP from the contractor for revising the CI's current technical documentation.

4.3.2 RFD Activity Guide.

RFDs are prepared and submitted to the government in accordance with the configuration requirements of the applicable contract SOW and CDRL/DD Form 1423. If the Government has established a CM AIS, the data requirement for RFDs should request digital submittal of NOR data or population of the DoD database directly by the contractor. [Ref: MIL-STD-2549, Appendix A] The communication between the contractor and Government

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CM AIS uses the pertinent data fields, arranged in the numbered sequence of MIL-STD-2549, DIP4, subpacket 4G, which cites the defined data elements of **MIL-STD-2549 Appendix C**.

The following Activity Guide [Table 4-9], delineates the data content of an RFD.

Table 4-9. Activity Guide: RFD Content

MIL-STD-2549, Information Packet 4G		MIL-STD-973 Appendix E
Seq. No.	Field Name	(DD1694) Block No.
RFD Identification And Administrative Attributes		
2, 4-6	RFD Identification & Rev, RFD Title	7b., d.,
7-24	Security, Rights, Distrib, Data Rights (Basic Document Protection Data Information Packet 8A)	Separate Reqt.
27	RFD Classification	14.c.
30-31	CDCA and Effective Date	N/A
32-33	Current RFD Status & Date	CSA data
34	Originator (Company Name) Note: Address is in Seq. 186	8
35-37	Application Activity & Status of Adoption/Rejection	N/A
39-40	Procuring Activity No. (PAN) ⁸ & PAN Yr.	2
RFD General Impact Information		
41	Baseline Affected	8
42-44	Recurring/Prior Deviation Identification	18
Description of Deviation		
50-51	Description Of Deviation (Summary) + Link To Detail	22
52-53	Need For Deviation (Summary) + Link To Detail	23
54	Link to Rationale for Recurring Deviation	N/A
55-56	Summary & Link to Corrective Action	24
63-68	Identification Of Supplement/Support Documents (Flag, Type, Source, Identifier, Rev and Specific affect	22
69-73	Affected Part/Material/Software identification	13, 15-16
74-78	Effectivity of RFD	17
Contract Information & RFD Impact		
94-96	Contract/Mod/Line Item	11
97	Effect on delivery schedule	20
140	Effect on cost/price	19
144	RFD Price Consideration rationale	19
185-223	Expanded Text File Identification (Data Information Packet 9B) (includes Seq. 178 -Originator Address, and detail for all link fields)	Referenced Enclosures and paragraphs
262-299	Document Representation Identification (Data Information Packet 10A)	

⁸ Used by Procuring Activity

4.4 Notice of Revision

A Notice of Revision (NOR) is an ancillary document to the ECP, which conveys the specific change to a specific document. A NOR is required when (1) the ECP is proposed by the Government (in the role of tasking or performing activity), (2) the party proposing the ECP is not the CDCA of the document being changed by the ECP, (3) the ECP is proposed by the tasking activity, or (4) the party proposing the ECP is not responsible for pricing logistics support impact.. For ECPs to documents that are controlled by the ECP originator, a NOR may be used at contractor option. Alternatively, the originator may describe the change to each document within the ECP.

***Note:** Requirements for SCNs have been eliminated because of their administrative complexity and because in the digital environment, it is preferable to maintain the specification current at all times and to archive each proceeding version. Furthermore, paragraph rather than page control of specifications is feasible and desired. Revised paragraphs can be inserted into the ECP, and be approved as part of the ECP, or where that is not practical, submitted to the approving authority during ECP implementation.*

4.4.1 NOR Concepts and Principles

ECP originators who do not control the configuration documentation (for example, specifications, master engineering drawings, associated data lists, computer software listings, and other similar documents) must prepare and attach a NOR with each proposed ECP that impacts such documentation. This is imperative since they do not have the capability of revising the documentation for documenting the redesign. Once an ECP is approved, the attached NOR allows the program office to direct the government activity responsible for maintaining the documentation to accurately update it.

NORs are prepared and submitted to the government in accordance with the configuration requirements of the applicable contract SOW and CDRL/DD Form 1423. If the Government has established a CM AIS, the data requirement for NORs should request digital submittal of NOR data or population of the DoD database directly by the contractor. [Ref: MIL-STD-2549, Appendix A] The communication between the contractor and Government CM AIS uses the pertinent data fields, arranged in the numbered sequence of MIL-STD-2549, DIP4, subpacket 4J which cites the defined data elements of MIL-STD-2549 Appendix C. [Detail: Activity Guide: Table 4-10]

4.4.2 NOR Activity Guide

Table 4-10. Activity Guide: NOR Content

MIL-STD-2549, Information Packet 4J		MIL-STD-973 Appendix G
Seq. No.	Field Name	(DD1694)Block No.
	NOR Identification And Administrative Attributes	
2, 4-6	NOR Identification & Revision	5, 6
7-24	Security, Rights, Distrib, Data Rights (Basic Document Protection Data Information Packet 8A)	Separate Requirement
30-31	CDCA and Effective Date	N/A
32-33	Current NOR Status & Date	1, 14, 15a.- c
34	Originator (Company Name)	4.A.-B.
64-67	Identification of Affected Document (Type, Source, Identifier, Revision)	7, 8, 9, 10
68	Specific Affect on Document (i.e., Description of Revision)	13
262-299	Document Representation Identification (Data Information Packet 10A)	
301-325	Parts List Changes (Data Information Packet 7B)	13
326-330	Changes to Notes	13

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